

ATTACHED ARE:

- 1) A transcribed copy of BAA 99-09 as it appeared in the *Commerce Business Daily* (CBD) of November 4, 1998 and
- 2) the BAA 99-09 Proposer Information Pamphlet.

Due to the possibility of transcription errors, the official CBD announcement takes precedence over this transcription in any disagreement between the two. The transcription is provided for your convenience only.

MOBILE AUTONOMOUS ROBOT SOFTWARE SOL BAA 99-09 DUE 01/27/99
POC Dr. Mark L. Swinson, DARPA/ITO, FAX: (703) 522-7161 WEB:
<http://www.ito.darpa.mil>. E-MAIL: baa99-09@darpa.mil.

Mobile autonomous robot software (MARS) enables the pervasive employment of mobile robots that can autonomously perform useful tasks in realistic, operational environments. These tasks may include platform mobility, navigation, obstacle avoidance, payload conveyance, payload operation (such as sensors, communications equipment, manipulators, and/or weapons), and human-robot interaction – without dependence on a human operator to exercise control authority. Application domains of interest to the Department of Defense include reconnaissance, surveillance and target acquisition (RSTA); countermine and explosive ordnance disposal; force protection and physical security; and logistics support operations.

Current mobile robots are either tele-operated (remotely driven/piloted in real-time) or tele-supervised (semi-autonomous). In the latter, the remote operator need only occasionally provide (near real-time) commands, a role analogous to a tank commander vs. a tank driver. In contrast, DARPA seeks a revolutionary change in the degree of autonomy, whereby the human supplies domain knowledge and mission orders, but is relieved of the need for making any synchronous control inputs (essentially now playing the role of a unit commander). The ultimate goal is to enable the employment of large numbers of autonomous robots by a single operator.

DARPA seeks new technologies for the missing software that will enable the continuous, safe, reliable, real-time, and autonomous operation of military unmanned systems in dynamic, unstructured environments. The resultant autonomy will not depend on high quality communications connectivity or a remote human operator for control inputs during mission execution. Robots employing this software will exhibit:

1. reprogrammable, goal-directed behaviors that can exploit symbolic, human-supplied information,
2. reflexive, sensor-mediated behaviors that exhibit stability even in complex, uncertain, dynamic environments,
3. a high degree of adaptability, including a facility for learning, and
4. the capability to safely and reliably operate in close proximity to humans.

The MARS program will address two key challenges to the realization of reusable software for autonomous mobile systems:

1. The development of a software framework that enables robots to synthesize the desirable features and capabilities of both deliberative (symbol mediated) and reactive (sensor mediated) control.
2. A software composition methodology that incorporates both programming (hand-coding) and learning-derived (automated coding) software composition to increase the ability of robots to function in unpredictable environments.

Proposals should identify which of the following alternative approaches to the above challenges their proposal most closely matches. The alternatives, which are referred to as technical topic areas for the purposes of this solicitation, are:

1. Soft Computing
2. Robot Shaping
3. Imitation
4. Other

Irrespective of the approach chosen, each proposal must describe how the performers will realize the following capabilities:

1. A software framework for hybrid deliberative/reactive control.
2. A software composition methodology which mitigates the intractability of exhaustively hand-coding all software-derived, robot functionality.
3. Software functionality to enable autonomous robots to operate safely in close proximity to humans.
4. Prototype software demonstrations and experiments.

While the focus is on software technology, the required context is a physically embodied entity operating in realistic environments and performing useful tasks. Proposals should include a laboratory demonstration using contractor furnished, mobile robot hardware, with an optional task of migrating their software to a second, government designated platform and conducting field demonstrations. Proposals should be for a base effort of 24 months, with two 12 month options. Research with a hardware component is not within the scope of this solicitation. Similarly, research on software-only, autonomous systems (knowbots) as well as research focussed on physically embodied agents, but which is to be conducted entirely in computer simulation, is also not within the scope of this solicitation.

PROGRAM SCOPE

Proposed research should investigate innovative approaches and techniques that lead to or enable revolutionary advances in the state-of-the-art. Proposals are not limited to the specific strategies listed above and alternative visions will be considered. However,

proposals should be for research that substantially contributes towards the goals stated. Research should result in prototype hardware and/or software demonstrating integrated concepts and approaches. Specifically excluded is research that primarily results in evolutionary improvement to the existing state of practice or focuses on a specific system or solution. Integrated solution sets embodying significant technological advances are strongly encouraged over narrowly defined research endeavors. Proposals may involve other research groups or industrial cooperation and cost sharing.

GENERAL INFORMATION:

In order to minimize unnecessary effort in proposal preparation and review, proposers are strongly encouraged to submit brief proposal abstracts in advance of full proposals. An original and nine (9) copies of the proposal abstract must be submitted to DARPA/ITO, ATTN: BAA 99-09, 3701 North Fairfax Drive, Arlington, VA 22203-1714, in time to reach DARPA by 4:00 PM (ET), Thursday, December 3, 1998, to guarantee review. Upon review, DARPA will make a recommendation to offerors either encouraging or discouraging submission of full proposals.

Proposers must submit an original and nine (9) copies of full proposals in time to reach DARPA by 4:00 PM (ET), Wednesday, January 27, 1999, in order to be considered. Proposers must obtain a pamphlet, BAA 99-09 Proposer Information, which provides further information on the areas of interest, submission, evaluation, funding processes, proposal abstracts, and full proposal formats. This pamphlet may be obtained by fax, electronic mail, or mail request to the administrative contact address given below, as well as at URL address <http://www.ito.darpa.mil/Solicitations.html>. Proposals not meeting the format described in the pamphlet may not be reviewed. This Commerce Business Daily notice, in conjunction with the pamphlet BAA 99-09 Proposer Information, constitutes the total BAA. No additional information is available, nor will a formal RFP or other solicitation regarding this announcement be issued. Requests for same will be disregarded.

The Government reserves the right to select for award all, some, or none of the proposals received.

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

Evaluation of proposals will be accomplished through a scientific review of each proposal using the following criteria, which are listed in descending order of relative importance:

- (1) overall scientific and technical merit,
- (2) potential contribution and relevance to DARPA mission,

- (3) offeror's capabilities and related experience,
- (4) plans and capability to accomplish technology transition, and
- (5) cost realism.

All administrative correspondence and questions on this solicitation, including requests for information on how to submit a proposal abstract or proposal to this BAA, must be directed to one of the administrative addresses below by 4:00 PM (ET), Wednesday, January 20, 1999; e-mail or fax is preferred. DARPA intends to use electronic mail and fax for some of the correspondence regarding BAA 99-09. Proposals and proposal abstracts may not be submitted by fax; any so sent will be disregarded.

The administrative addresses for this BAA are:

Fax: 703-522-7161 Addressed to: DARPA/ITO, BAA 99-09
Electronic Mail: baa99-09@darpa.mil
Electronic File Retrieval: <http://www.ito.darpa.mil/Solicitations.html>
Mail: DARPA/ITO
ATTN: BAA 99-09
3701 North Fairfax Drive
Arlington, VA 22203-1714

Posted 11/02/98 (W-SN267262). (0306)

SPONSOR: Defense Advanced Research Projects Agency (DARPA), Contract Management Directorate (CMD), 3701 N. Fairfax Dr., Arlington, VA 22203-1714

SUBFILE: PSE (U.S. GOVERNMENT PROCUREMENTS, SERVICES)

SECTION HEADING: A Research and Development

PUBLICATION DATE: NOVEMBER 4, 1998

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BAA 99-09 PROPOSER INFORMATION PAMPHLET

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will appear first in the *Commerce Business Daily*, published by the U.S. Government, Department of Commerce. The following information is for those wishing to respond to the Broad Agency Announcement.

MOBILE AUTONOMOUS ROBOT SOFTWARE SOL BAA 99-09 DUE 1/27/99

POC Dr. Mark L. Swinson, DARPA/ITO, FAX: (703) 522-7161

Mobile autonomous robot software (MARS) enables the pervasive employment of mobile robots that can autonomously perform useful tasks in realistic, operational environments. These tasks may include platform mobility, navigation, obstacle avoidance, payload conveyance, payload operation (such as sensors, communications equipment, manipulators, and/or weapons), and human-robot interaction -- without dependence on a

human operator to exercise control authority. Application domains of interest to the Department of Defense include reconnaissance, surveillance and target acquisition (RSTA); countermine and explosive ordnance disposal; force protection and physical security; and logistics support operations.

Current mobile robots are either tele-operated (remotely driven/piloted in real-time) or tele-supervised (semi-autonomous). In the latter, the remote operator need only occasionally provide (near real-time) commands, a role analogous to a tank commander vs. a tank driver. In contrast, DARPA seeks a revolutionary change in the degree of autonomy, whereby the human supplies domain knowledge and mission orders, but is relieved of the need for making any synchronous control inputs (essentially now playing the role of a unit commander). The ultimate goal is to enable the employment of large numbers of autonomous robots by a single operator.

DARPA seeks new technologies for the missing software that will enable the continuous, safe, reliable, real-time, and autonomous operation of military unmanned systems in dynamic, unstructured environments. The resultant autonomy will not depend on high quality communications connectivity or a remote human operator for control inputs during mission execution. Robots employing this software will exhibit:

- 1) reprogrammable, goal-directed behaviors that can exploit symbolic, human-supplied information,
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The MARS program will address two key challenges to the realization of reusable software for autonomous mobile systems:

- 1) The development of a software framework that enables robots to synthesize the desirable features and capabilities of both deliberative (symbol mediated) and reactive (sensor mediated) control.
- 2) A software composition methodology that incorporates both programming (hand-coding) and learning-derived (automated coding) software composition to increase the ability of robots to function in unpredictable environments.

Proposals should identify which of the following alternative approaches to the above challenges their proposal most closely matches. The alternatives, which are referred to as technical topic areas for the purposes of this solicitation, are:

- 1) Soft Computing
- 2) Robot Shaping
- 3) Imitation
- 4) Other

Irrespective of the approach chosen, each proposal must describe how the performers will realize the following capabilities:

- 1) A software framework for hybrid deliberative/reactive control.
- 2) A software composition methodology which mitigates the intractability of exhaustively hand-coding all software-derived, robot functionality.
- 3) Software functionality to enable autonomous robots to operate safely in close proximity to humans.
- 4) Prototype software demonstrations and experiments.

While the focus is on software technology, the required context is a physically embodied entity operating in realistic environments and performing useful tasks. Proposals should include a laboratory demonstration using contractor furnished, mobile robot hardware, with an optional task of migrating their software to a second, government designated platform and conducting field demonstrations. Proposals should be for a base effort of 24 months, with two 12 month options. Research with a hardware component is not within the scope of this solicitation. Similarly, research on software-only, autonomous systems (knowbots) as well as research focussed on physically embodied agents, but which is to be conducted entirely in computer simulation, is also not within the scope of this solicitation.

TECHNICAL TOPIC AREAS:

In all cases proposals must exhibit science-based approaches that are well grounded in the underlying physical and mathematical principles. Proposals are sought in the following topic areas:

- 1) Soft Computing - software composition emphasizing programming.

Soft computing is a collection of software technologies that are designed to be tolerant of imprecision. This domain is currently considered to be a confluence of several distinct, complementary software technologies including fuzzy logic, artificial neural networks, and probabilistic reasoning (including evolutionary algorithms, chaos theory, and belief networks.) Various types and levels of behaviors (or schemas) are programmed, with learning employed to refine both the execution and the coordination of those behaviors. Soft computing generally takes a *behavior-centric* approach to the incorporation of human knowledge and direction.

- 2) Robot Shaping - software composition balanced between programming and learning.

Robot shaping employs a more automated approach to the composition of the software. Here the shaping (training) techniques are somewhat analogous to a high level tasking language for the programming of autonomous robots. Humans provide the domain and task knowledge, generally in the form of a training protocol, while the computer provides most of the “low-level learning” needed to compile the taskings into procedural instructions. Such strategies may also facilitate the combining of learned sub-behaviors into higher level behaviors without explicit human direction. Robot shaping takes a *training-centric* approach to the incorporation of human knowledge and direction.

3) Imitation - software composition emphasizing robot learning.

Imitation emphasizes the robot's ability to observe, understand, and reproduce a desired behavior by leveraging the characteristics of the embodiment to enhance the information richness of the interactions as well as "mapping" the behavior onto the robot. Imitation may take the form of supervised learning (such as that based on reinforcement) as well as unsupervised, self-learning. One can view this strategy as an improved learning paradigm with information-rich interactions, or as an improved programming paradigm with behaviors "shown" instead of "told." Regardless, imitation employs an *interaction-centric* approach to the incorporation of human knowledge and direction.

4) Other

CAPABILITY AREAS:

Proposals must describe how they will realize all of the following capabilities:

1) A software framework for hybrid deliberative/reactive control.

Reactive (sensor mediated, behavior-based, bottom-up, subsumptive) control is very robust to environmental uncertainty, but has only been demonstrated to work for simple behaviors exhibiting a high degree of task structure (e.g. chemotaxis). Scaling up to more complex behaviors has proven problematic, as has the incorporation of symbolic information. Conversely, deliberative (symbol mediated, "intelligent", top-down, hierarchical) control can readily incorporate human-supplied knowledge, and thereby undertake relatively abstract tasks, but requires an unacceptably high degree of environmental structure and/or predictability to enable the use of a "world model" to generate control actions. Hybrid deliberative/reactive approaches seek to synthesize the desirable traits of each, but the interface between deliberative and reactive execution is not well understood. This is especially true for information that must cross the boundary between deliberative and reactive layers, including compatible knowledge representations, data for dynamic reconfiguration of the control system, sensor data acquisition/processing, and data for strategic planning. DARPA seeks to develop a single software framework to symbiotically integrate deliberative and reactive functionality. Within this framework, the capability to improve performance with experience (open to learning during run-time) is also sought.

2) A software composition methodology which mitigates the intractability of exhaustively hand-coding all software-derived, robot functionality.

Since the conception of mobile robots, researchers have sought methods to enable these physically embodied agents to perform complex behaviors while interacting intelligently with the environment. The most common software composition solutions are robot programming and robot learning. By robot programming, we mean endowing the robot with all of its software-enabled functionality, apriori, by hand-coding the software. This

approach has significant limitations, resulting both from our inability to adequately describe complex behaviors (let alone their integration), as well as our inability to exhaustively model the environment. Conversely, robot learning, while theoretically able to address these issues, has yet to convincingly demonstrate that it has the power to automatically generate all the desired software functionality (let alone feasibility in any practical application). Ideally, the human's software composition responsibilities should be focused primarily on providing task and domain knowledge (where humans excel), while the more tedious, coding tasks are automated (not to mention much of the complexity is encapsulated.) Also, despite the fidelity limitations, DARPA seeks suitable methods for utilizing computer simulation to both enhance and accelerate robot learning. Methods to ensure that the robot learns the correct behavior, as well as the ability to detect and correct erroneously learned behaviors, are also sought.

- 3) Software functionality to enable mobile autonomous robots to operate safely in close proximity to humans.

This technology should include multiple, independent safeguards to enable the robot to exhibit considerable tolerance to any human failure to follow prescribed operating procedures or protocols. These safety features should be intrinsic, degrade gracefully, and require no overt action by humans during mission execution to ensure their proper and reliable function.

- 4) Prototype software demonstrations and experiments.

Proposers should include a discussion of how they will demonstrate the required software on a contractor furnished, autonomous mobile robot of their choosing. The base effort should include a laboratory demonstration of the software, integrated into and controlling the robot. Proposals should describe the metrics and methodology by which the preceding capabilities will be evaluated in the context of the demonstration. Proposals should also include an option for the performer to migrate the developed software to a government designated, robot platform for field demonstration.

PROGRAM SCOPE:

Proposed research should investigate innovative approaches and techniques that lead to or enable revolutionary advances in the state-of-the-art. Proposals are not limited to the specific strategies listed above and alternative visions will be considered. However, proposals should be for research that substantially contributes towards the goals stated. Research should result in prototype hardware and/or software demonstrating integrated concepts and approaches. Specifically excluded is research that primarily results in evolutionary improvement to the existing state of practice or focuses on a specific system or solution. Integrated solution sets embodying significant technological advances are strongly encouraged over narrowly defined research endeavors. Proposals may involve other research groups or industrial cooperation and cost sharing.

SUBMISSION PROCESS:

Proposers are strongly encouraged to submit a proposal abstract in advance of actual proposals. This procedure is intended to minimize unnecessary effort in proposal preparation and review. An original and nine (9) copies of the proposal abstract must be submitted to DARPA/ITO, ATTN: BAA 99-09, 3701 North Fairfax Drive, Arlington, VA 22203-1714, in time to reach DARPA by 4:00 PM (ET), Thursday, December 3, 1998, to guarantee review. An original and nine (9) copies of each proposal must be submitted to the administrative address for this BAA in time to reach DARPA by 4:00 PM (ET), Wednesday, January 27, 1999, in order to be considered. DARPA will acknowledge receipt of submissions and assign control numbers that should be used in all further correspondence regarding abstracts and proposals.

DARPA will attempt to review proposal abstracts within 30 days after receipt and will make a recommendation encouraging or discouraging formal proposal submissions. Proposal abstracts will be reviewed as they are received. Early submissions are strongly encouraged. Regardless of the recommendation, the decision to propose is the responsibility of the proposer. All submitted proposals will be fully reviewed regardless of the disposition of the proposal abstract.

The typical proposal should express a consolidated effort in support of one or more technical topic areas. Disjoint efforts should not be included in a single proposal.

Restrictive notices notwithstanding, proposals may be handled, for administrative purposes only, by a support contractor. This support contractor is prohibited from competition in DARPA technical research and is bound by appropriate non-disclosure requirements.

EVALUATION AND FUNDING PROCESSES:

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons. For evaluation purposes, a proposal is the document described in PROPOSAL FORMAT Section I and Section II (see below). Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal.

Evaluation of proposals will be accomplished through a scientific review of each proposal using the following criteria, which are listed in descending order of relative importance:

- (1) overall scientific and technical merit,
- (2) potential contribution and relevance to DARPA mission,
- (3) offeror's capabilities and related experience,
- (4) plans and capability to accomplish technology transition, and
- (5) cost realism.

Proposals may be reviewed by non-government personnel; however, contractors will not be used to conduct evaluations or analyses of any aspect of a proposal submitted under this BAA unless one of the three conditions identified in FAR 37.203(d) applies.

As soon as the proposal evaluation is completed, the proposer will be notified of selectability or non-selectability. Selectable proposals will be considered for funding; non-selectable proposals will be destroyed. (Copies of non-selectable proposals may be retained for filing purposes.) Not all proposals deemed selectable will be funded. Decisions to fund selectable proposals will be based on funds available, scientific and technical merit, and potential contribution and relevance to DARPA's mission and offeror's capabilities and expertise. DARPA may retain some selectable proposals for a period of up to one year in order to reconsider those proposals for funding. Submitters of those retained proposals will receive notification to that effect.

The Government reserves the right to select for award all, some, or none of the proposals received. Proposals identified for funding may result in a contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors. If warranted, portions of resulting awards may be segregated into pre-priced options.

GENERAL INFORMATION:

Proposals not meeting the format described in this pamphlet may not be reviewed. Proposals and proposal abstracts may not be submitted by fax; any so sent will be disregarded. The *Commerce Business Daily* notice, in conjunction with this pamphlet, BAA 99-09 Proposer Information, constitutes the total BAA. No additional information is available, nor will a formal RFP or other solicitation regarding this announcement be issued. Requests for same will be disregarded. All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

PROPOSAL ABSTRACT FORMAT:

Proposal abstracts are encouraged in advance of full proposals in order to provide potential offerors with a rapid response and to minimize unnecessary effort. The abstract submission should be clearly marked "PROPOSAL ABSTRACT" and should include a cover sheet and a technical section.

The cover sheet should include: (1) BAA number; (2) Technical topic area; (3) Proposal title; (4) Technical point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (5) Administrative point of contact including: name, telephone number, electronic mail address, fax (if available) and

mailing address; (6) Summary of the costs of the proposed research, including total base cost, estimates of base cost in each year of the effort, estimates of itemized options in each year of the effort, and cost sharing if relevant; and (7) Contractor's type of business, selected from among the following categories: "LARGE BUSINESS," "SMALL DISADVANTAGED BUSINESS," "OTHER SMALL BUSINESS," "HBCU," "MI," "OTHER EDUCATIONAL," or "OTHER NONPROFIT."

The technical section of the abstract should include the following: A. { 1 page } Innovative claims for the proposed research. This page is the centerpiece of the abstract and should succinctly describe the unique proposed contribution; and B. { 4 pages } Technical rationale, technical approach and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable products. Include comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.

The total length of the abstract should not exceed six pages including the cover sheet. Proposal abstracts ONLY (not proposals) may alternatively be submitted via electronic mail to baa99-09@darpa.mil. E-mail submissions must be formatted as plain ASCII, 72 characters to the line, 60 lines to the page. This is the only format that will be accepted. No formal transmittal letter is required.

PROPOSAL FORMAT:

Proposals shall include the following sections, each starting on a new page (where a "page" is 8-1/2 by 11 inches with type not smaller than 12 point) and with text on one side only. The submission of other supporting materials along with the proposal is strongly discouraged. Sections I and II of the proposal shall not exceed 40 pages. Maximum page lengths for each section are shown in braces { } below.

Section I. Administrative

{ 1 } Cover Page including: (1) BAA number; (2) Technical topic area; (3) Proposal title; (4) Technical point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (5) Administrative point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (6) Summary of the costs of the proposed research, including total base cost, estimates of base cost in each year of the effort, estimates of itemized options in each year of the effort, and cost sharing if relevant; and (7) Contractor's type of business, selected from among the following categories: "LARGE BUSINESS," "SMALL DISADVANTAGED BUSINESS," "OTHER SMALL BUSINESS," "HBCU," "MI," "OTHER EDUCATIONAL," or "OTHER NONPROFIT."

Section II. Detailed Proposal Information

This section provides the detailed discussion of the proposed work necessary to enable an in-depth review of the specific technical and managerial issues. Specific attention must be given to addressing both risk and payoff of the proposed work that make it desirable to DARPA.

- A. {1} Innovative claims for the proposed research. This page is the centerpiece of the proposal and should succinctly describe the unique proposed contribution.
- B. {18} Technical rationale, technical approach and constructive plan for accomplishment of technical goals in support of innovative claims and deliverables.
- C. {2} Deliverables associated with the proposed research. Include in this section all proprietary claims to results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this should be stated. The offeror must submit a separate list of all technical data or computer software that will be furnished to the Government with other than unlimited rights (see DFARS 227.)
- D. {3} Statement of Work (SOW) written in plain English, outlining the scope of the effort and citing specific tasks to be performed and specific contractor requirements.
- E. {1} Schedule of milestones for the proposed research.
- F. {2} Technology Transfer. Description of the transferable technology and expected technology transfer path.
- G. {3} Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.
- H. {3} List of key personnel, concise summary of their qualifications, and discussion of proposer's previous accomplishments and work in this or closely related research areas. Indicate the level of effort to be expended by each person during each contract year and other (current and proposed) major sources of support for them and/or commitments of their efforts. DARPA expects all key personnel associated with a proposal to make substantial time commitment to the proposed activity.
- I. {1} Description of the facilities that would be used for the proposed effort.
- J. {5} Cost by task, with breakdown into accounting categories and equipment for the entire contract and for each contract year. Where the effort consists of multiple portions that could reasonably be partitioned for purposes of funding, these should be identified as contract options with separate cost estimates for each. Details of any cost sharing should also be included. Budgets for Government furnished/funded equipment should be limited to experimental apparatus and exclude office and laboratory equipment normally associated with Information Technology research

environments, such as servers, workstations, PCs, laptops, PDAs, routers, printers, copiers, fax machines, etc.

Awards made under this BAA may be subject to the provisions of the Federal Acquisition Regulation (FAR) Subpart 9.5, Organizational Conflict of Interest. All offerors and proposed subcontractors must affirmatively state whether they are supporting any DARPA technical office(s) through an active contract or subcontract. "Support contract" or "support contractor" includes a contract or subcontract for acquisition of System Engineering and Technical Assistance (SETA) services, and other support service contracts in which any one of the following situations apply: have personnel who regularly maintain offices or frequently occupy space within DARPA; maintain external spaces in which DARPA personnel maintain offices or frequently occupy; or have personnel with any access to the DARPA fiscal database, EIS, or contractual or programmatic documentation related to other than their own contract(s). All affirmations must state which office(s) the offeror supports, and identify the prime contract number. Affirmations should be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest, as that term is defined in FAR 9.501, must be disclosed in Section II., H of the proposal, organized by task and year. This disclosure shall include a description of the action the Contractor has taken, or proposes to take, to avoid, neutralize, or mitigate such conflict.

Section III. Additional Information

A bibliography of relevant technical papers and research notes (published and unpublished) that document the technical ideas upon which the proposal is based. Copies of not more than three relevant papers may be included in the proposal submission; provide one set for the original proposal and one set for each of the nine (9) proposal copies. Please note: the materials listed in Section III. Additional Information, and submitted with the proposal, will be considered for the reviewer's convenience only and not considered as part of the proposal for evaluation purposes.

Additional Electronic Submission Encouraged

In ADDITION to the paper proposals, proposers are strongly encouraged to send ASCII text electronic copies of the statement of work and equipment needs to the following email address: baa99-09@darpa.mil. The title of the proposal and the name of the proposing organization must be provided as a header to enable administrative staff to match these electronic submissions with the full proposals. The statement of work and equipment budgets must be identical (except for format) to the statement of work in the full proposal.

The administrative addresses for this BAA are:

Fax: 703-522-7161 Addressed to: DARPA/ITO, BAA 99-09

Electronic Mail: baa99-09@darpa.mil

Electronic File Retrieval: <http://www.ito.darpa.mil/Solicitations.html>

Mail: DARPA/ITO
ATTN: BAA 99-09
3701 North Fairfax Drive
Arlington, VA 22203-1714